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The 2022 Ohio Agriculture Brochure

Radiological Emergency Information for Food Producers, Processors and Distributors

Ohio | Department of Agriculture

Prepared by the Ohio Department of Agriculture,
in cooperation with the following agencies:

Ohio Emergency Management Agency
Ohio Department of Health
Ohio Department of Natural Resources
Ohio Environmental Protection Agency
Ohio State University Extension
U.S. Department of Agriculture - Farm Service Agency

Do Not Discard. Keep this document handy, in case of emergency.

Ohio | Department of Agriculture
Governor Mike DeWine • Lt. Governor Jon Husted
Director Dorothy Pelanda

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February 2022

Dear Recipient:

The enclosed Ohio Agriculture Brochure is provided to Ohio farmers, agricultural workers, food producers, distributors and processors with land or businesses located near a nuclear power station on an annual basis to inform you of possible actions you may be advised to take to protect your farm products in the event of a nuclear power plant emergency.

The following page contains the telephone numbers of your local county Emergency Management Agency and the Ohio State University Extension office. These organizations can provide further information and explanation regarding the content of this brochure.

In the event of an emergency, specific instructions for farmers and food processors will also be issued by the Ohio Emergency Management Agency in cooperation with the Ingestion Zone Recovery and Reentry Advisory Group.

I hope you will find this information useful. Please keep this brochure available for reference.

Sincerely,

Dorothy Pelanda

Dorothy Pelanda, Director

Ohio Counties within a 50-Mile Radius of Nuclear Power Plants

State of Ohio Emergency Management Agency (614) 889-7150
OSU Extension, Agriculture & Natural Resources (614) 292-4077
https://extension.osu.edu/lao#county

County	Emergency Management Agency	OSU Extension Office
Ashtabula	440-576-9148	440-576-9008
Belmont	740-695-5984	740-695-1455
Carroll	330-627-0003	330-627-4310
Columbiana	330-424-9725	330-424-7291
Crawford	419-562-6009	419-562-8731
Cuyahoga	216-443-5683	216-429-8200
Erie	419-627-7617	419-627-7631
Fulton	419-337-9207	419-337-9210
Geauga	440-279-2171	440-834-4656
Hancock	419-424-7092	419-422-3851
Harrison	740-942-3922	740-942-8823
Henry	419-592-4876	419-592-0806
Huron	419-663-5772	419-668-8219
Jefferson	740-264-4646	740-264-2212
Lake	440-350-5499	440-350-2582
Lorain	440-329-5117	440-326-5851
Lucas	419-213-6506	419-213-4254
Mahoning	330-740-2200	330-533-5538
Ottawa	419-734-6900	419-898-3631
Portage	330-297-3607	330-296-6432
Sandusky	419-334-8933	419-334-6340
Seneca	419-447-0266	419-447-9722
Stark	330-451-3900	234-348-6001
Summit	330-643-2558	330-928-4769
Trumbull	330-675-2666	330-638-6783
Tuscarawas	330-308-6671	330-339-2337
Wood	419-354-9269	419-354-9050
Wyandot	419-294-6406	419-294-4931

The Agriculture (Ag) Brochure is prepared for Ohio farmers, agricultural workers, food processors, distributors and processors with land or businesses located within 50 miles of a nuclear power station.

The Ag Brochure:

- Provides basic information on radiation
- Provides information on steps to take if a radiological incident occurs at a nuclear power plant
- Contains information concerning preventive action to protect food, milk, soil and water supplies
- Contains notification information and safety procedures

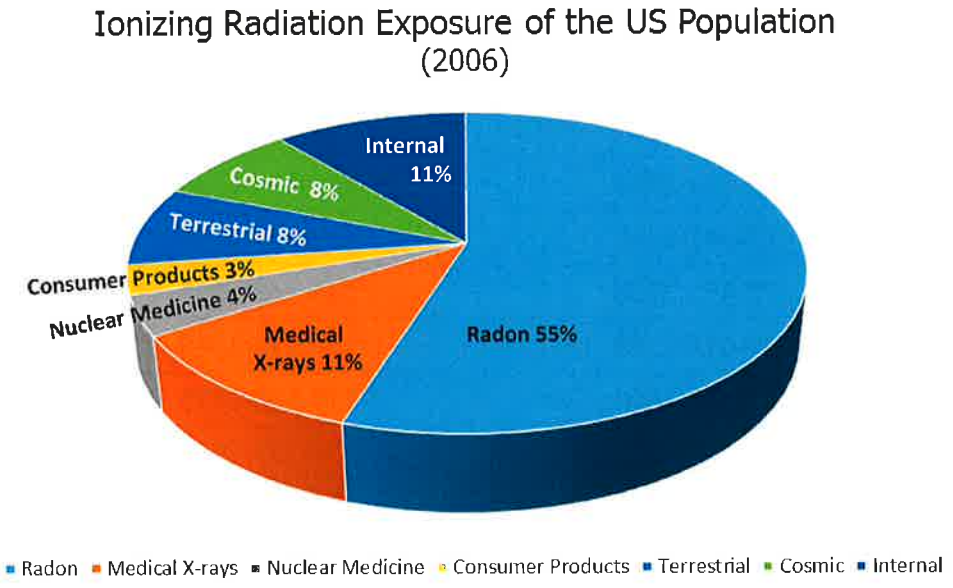
In the unlikely event of a release of radioactive material into the environment, you may be advised to take actions to protect your family, farm animals and agricultural products. You will receive specific instructions over the Emergency Alert System (EAS) or through other official news sources. Farmers will receive additional instructions via Ohio State University Extension offices. This information will help you prevent or minimize the effects of radiation on you, your family, livestock, milk and agricultural products.

About Radiation

Radiation and radioactive materials are a natural part of our world. They are in the food we eat, the air we breathe, in our soil, our homes and even in our bodies.

Naturally existing radiation is called "background radiation." It may vary greatly from one location to another, depending on factors such as solar radiation, elevation, soil makeup, radon gasses from the earth, and building materials.

The effects of radiation exposure on people depend on the amount and length of time of exposure, how much of the body is exposed (both internally and externally), and the general health and age of the person. The internal exposure as an ingestion hazard is of concern due to the close proximity of critical organs as compared to external exposure.



This graph is taken from the National Council on Radiation Protection and Measurements (NCRP) Report No. 93, Ionizing Radiation Exposure of the Population of the United States, 2006. The average total dose is about 620 millirems per year.

Natural Radiation Sources:
Radon, Internal, Terrestrial & Cosmic

Man-Made Radiation Sources:
Medical X-rays, Nuclear Medicine, Consumer Products, Other

Other (<1%):
Occupational (0.3%), Fallout (<0.3%), Nuclear Fuel Cycle (0.1%), Miscellaneous (0.1%)

Radiation Effects on Food and Water

A release of airborne radioactive materials is possible during an emergency at a nuclear power plant. These materials may not be visible and could fall to the surface and settle on land and water surfaces. This is called deposition. Depending on the amount of radioactive materials released into the atmosphere and the prevailing weather conditions, people, animals, crops, land and water near the power plant could be affected.

Of initial concern would be the condition of fresh milk from dairy animals grazing on pasture and drinking from open water sources. If contamination of fresh milk and processed milk is verified, the Ohio Department of Agriculture will determine whether to dispose of these products or to hold them until safe for consumption.

International symbol for irradiation

A later concern involves vegetables, grains, fruits and nuts and their possible contamination caused by deposition. The impact of contamination will depend on the time of year the emergency occurred. The period immediately prior to or during harvest is most critical. Crops will be sampled by the Ohio Department of Agriculture and analyzed to ensure that they are safe for consumption.

If land becomes contaminated, proper soil management techniques can be used to reduce contamination of crops. Procedures that may be recommended will depend on the severity of contamination and the specific crops to be grown. Soils will be sampled by the Ohio Environmental Protection Agency and analyzed for use.

Emergency Protective Actions and Information

It is unlikely that a serious radiological incident will happen at a commercial nuclear power plant. However, it is important that you are prepared for such an event. The information in this brochure will help you respond to radiological incidents. Please read this brochure and keep it available for reference.

If you live within 10 miles of a nuclear power plant, you will be alerted by sirens, an emergency vehicle equipped with a loud speaker, tone alert radio, or other appropriate means, such as door-to-door notification by emergency services personnel. If you live outside the 10-mile area, you will be alerted by radio or television broadcasts. Residents and businesses within 10 miles of the facility should also have emergency preparedness information (EPI) handy for quick reference. This information is provided in your phone book under "Emergency Information" or can be obtained from your county emergency management office.

Tune your radio or TV to a local station that carries Emergency Alert System (EAS) information. You may want to verify EAS stations by checking your EPI or contacting your local emergency management agency. For quick and easy reference, list your EAS stations here:

Emergency Protective Actions and Information (continued)

Follow the directions of the state of local emergency response officials as provided by the EAS. If you live within 10 miles of a nuclear power plant, you may be advised to take shelter or evacuate. This will help protect you and your family from possible exposure to increased levels of radiation. If you live more than 10 miles from a nuclear power plant, it may not be necessary to evacuate or take shelter.

You may be advised to take the following protective measures:

- Use stored feed and protected water supplies for your livestock and poultry.
- Remove animals from pasture and shelter them.

State and local officials may recommend additional protective actions. Specific instructions will depend on weather conditions and the distance of your farm and facility from the nuclear power plant. The following lists some examples:

- When you go outside, wear outer clothing that covers all areas of the body - similar to what you would wear when applying chemicals: hat, gloves, boots, coveralls or long shirts and long pants.
- Wear a protective mask similar to when applying chemicals, or place a folded, dampened cloth over your mouth and nose to prevent inhaling radioactive materials.
- Remove outer clothing before going indoors. Once inside, wash your hands and face immediately.
- Do not use fresh milk, eggs, fruits or vegetables from your farm until they are sampled by state sampling teams and are determined safe for consumption.
- Do not produce dust from activities such as cultivating, baling, disking or harvesting.
- Do not fish or hunt.
- Do not process or distribute agricultural products or food products until they are sampled by state sampling teams. The Ohio Department of Agriculture will determine if the products are safe for consumption. This process may take several days.
- Do not destroy agricultural products unless advised to do so.

Emergency Planning Zones

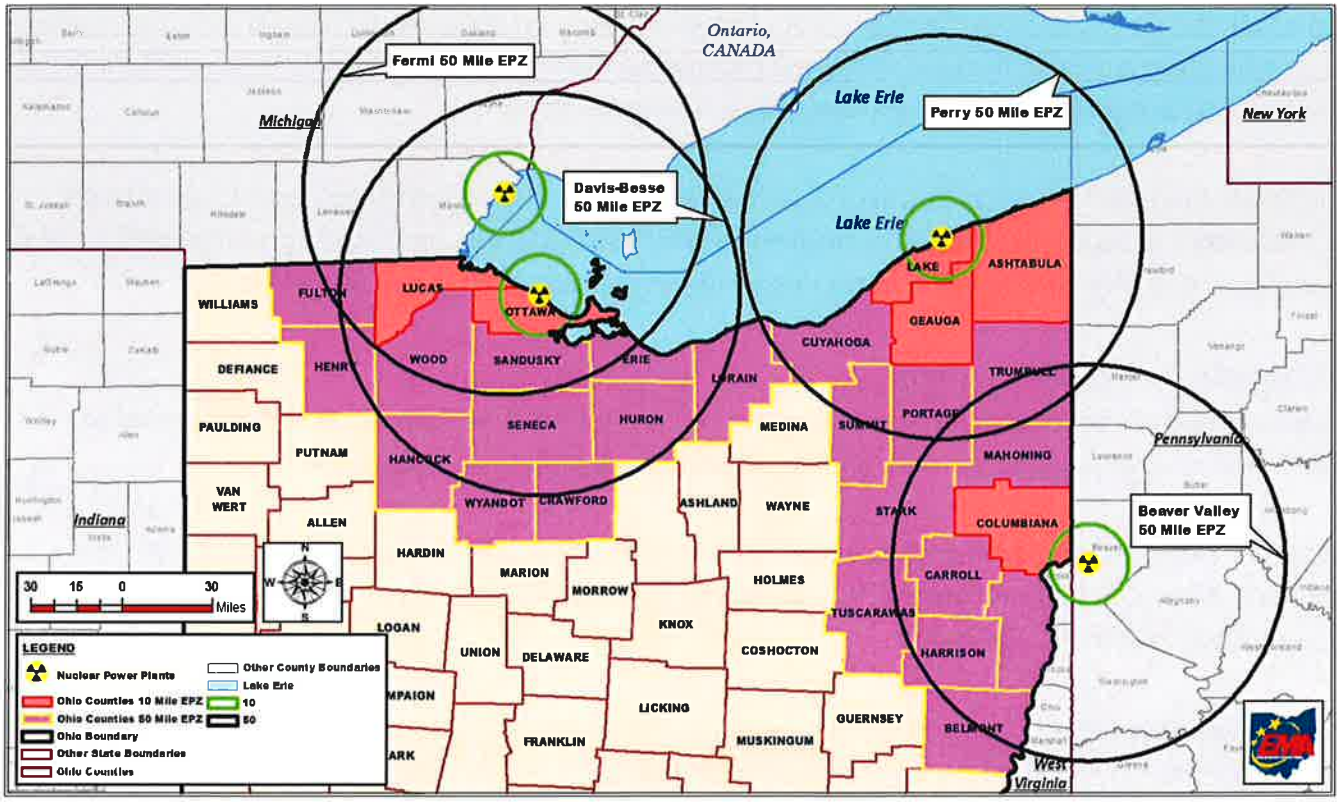
There are two Emergency Planning Zones (EPZ) referred to in a radiological emergency:

1. **Plume Exposure Pathway EPZ** - An approximate 10-mile radius around a nuclear power plant. If there is a release of radioactive materials, evacuation or sheltering could be recommended.

2. **Ingestion Exposure Pathway EPZ** - An approximate 50-mile radius around a nuclear power plant. Evacuation or sheltering of people is not expected beyond a 10-mile area. The safety of the food supply within the ingestion zone could become a concern. There could be internal exposure if you eat or drink contaminated products. Eating and drinking contaminated products could have harmful long-term health effects. Emergency Planning Zones are illustrated on the next page.

Nuclear Power Plants affecting Ohio

The large outer ring represents a 50-mile radius, while the small, green inner ring represents a 10-mile radius. The orange-colored counties have areas within the 10-mile radius; the purple-colored counties have areas within the 50-mile radius. See page 3 for a complete list of counties impacted by nuclear power plants. If a ring contains only a portion of the county, the entire county is considered as potentially impacted by the plant.



There are four nuclear power plants in or near Ohio that affect and/or provide power to Ohio citizens:

- **Davis-Besse Nuclear Power Station** - located in Ottawa County, 10 miles northwest of Port Clinton
- **Perry Nuclear Power Plant** - located in Lake County, seven miles northeast of Painesville
- **Beaver Valley Power Station** - located in Pennsylvania, four miles east of the Columbiana County/ Pennsylvania border
- **Fermi-II Nuclear Power Plant** - located in Michigan, 20 miles northeast of Toledo

Additional Emergency Information

In addition to specific protective action recommendations being issued by state and county officials through your local radio and TV stations, Ohio State University Extension agents will also provide suggestions on recommending protective actions. Website: http://extension.osu.edu/

The Ohio Emergency Management Agency will also have operators available to answer your questions concerning protective actions and emergency information. Its toll-free number: 866-OHIO-EMA (866-644-6362) will also be made public through news releases and EAS messages.

Protective Action Guidelines

Protective Action Guidelines are guides used in planning for protective actions to safeguard public health. The actions are taken to limit the radiation dose from ingestion by avoiding or reducing the contamination in or on human food and animal feeds, following the release of radionuclides. In order to ensure public safety, set points have been established as part of the guidelines.

Example actions taken to prevent the public from exceeding these set points could include covering exposed products, providing protected feed and water and prohibiting the transportation of food products from the affected areas. ***Do not process or destroy crops unless advised to do so.***

State officials from the Ohio Department of Agriculture and other state agencies will advise you on what protective actions to take. These agencies are supported by local officials, such as your county board of health. These officials will give consideration to the impact of the protective actions on the public.

Food Supply Protective Actions

The following are examples of protective actions and related information that may be recommended to you by state and local emergency officials. You will be advised on what actions to take.

A ***temporary embargo*** can be issued to prevent possible contaminated food from being introduced into commerce if there is credible evidence that contamination may have taken place. The embargo may be used before sampling has been conducted.

Milk & Dairy Products

There are a number of actions you can take to prevent your farm animals from consuming contaminated feed and water. These actions include:

- Remove all dairy animals from pasture and shelter them.
- Give dairy animals feed from enclosed barns, sheds, granaries and silos. Feed stored outside, which is directly exposed to air and rain, may be contaminated. This includes feed stored in sheds and cribs with open sides, uncovered hay stacks or bales, trench silos, and upright silos without doors.
- Give animals water protected from direct contact with air and rain.

State agents may visit your farm to take samples of milk, feed and water to test for contamination. The Ohio Department of Agriculture may recommend that milk and dairy products be withheld from the market. Time will reduce the amount of radioactive materials that might be present in milk. Fluid milk may be kept for long periods of time using ultra-high temperature pasteurization. In addition, producing cheese, dry milk, butter and evaporated milk using fluid milk may be a possibility to reduce the radioactive contamination.

Fruits & Vegetables

The Ohio Department of Agriculture may recommend that you wash, scrub, peel and/or shell all locally grown fruits and vegetables, roots (such as carrots), and tubers (such as potatoes) to remove any surface contamination.

Meats & Meat Products

Shelter meat animals and provide them with protected feed and water. If livestock consume contaminated feed and water, contamination can be absorbed into their bodies and enter the food chain through meats and meat products.

Do not destroy, market or slaughter animals unless directed by the Ohio Department of Agriculture.

Poultry & Egg Production

Poultry raised outdoors or kept in open pens should be sampled to determine radioactive contamination. Poultry raised indoors and kept on stored feed and water should not become contaminated. If there is contamination, the Ohio Department of Agriculture may advise that poultry and eggs not be eaten or distributed. Samples collected by ODA may be analyzed for contamination.

Fish & Marine Life

Lake, river, pond fish and aquaculture should be sampled before being consumed or distributed. The Ohio Department of Natural Resources may take samples of marine life for analysis.

Soil Management

The Ohio Environmental Protection Agency will take soil samples to determine contamination. If the soil is found to be contaminated, state officials will advise how to reduce or remove this contamination by some of the following methods:

- **Idling** - Radioactivity may decrease significantly over a period of weeks or months, and in some cases may radiologically decay away, entirely.
- **Planting Alternate Crops** - To substitute other crops that contribute little or no contamination to the human diet.
- **Deep Plowing** - Radioactive substances are moved well below root levels to prevent uptake of contaminants.
- **Removal** - In situations involving highly contaminated soil, removal and disposal may be appropriate.
- **Liming** - Liming the soil will limit the uptake of contaminants by the crops.

Grains

If your crops are in the field and are permitted to grow to maturity, wind and rain will remove most of the contamination from the grains. If your crops are at maturity, milling and polishing will remove the contamination from the grain. When harvesting, contaminated and uncontaminated grains should be stored separately. Samples may be taken by the Ohio Department of Agriculture.

Water

Protect open rain barrels, tanks and open wells by covering them with tarpaulins or plywood. Covered or underground water sources are unlikely to be contaminated.

Disconnect filler pipes from roof runoffs to water storage containers. This prevents contaminants from entering the water storage. Do the same for other surface-to-water supplies. Close water intake valves from any contaminated water source to irrigation systems. This will prevent further spread of contaminated water. Samples will be taken by the Ohio Environmental Protection Agency, to test public water systems and supplies and will issue advisories as needed.

Honey

The Ohio Department of Agriculture will take samples of honey and beehives to detect any contamination, and then advise you on how to handle the honey and hives.

Actions for Food Processors and Distributors

Milk and food products in an affected area can become contaminated during collection and processing. This can result from contact with radioactive materials that were deposited on the ground or from mixing with contaminated products. After a radiological emergency, state agencies may restrict shipment of food products if they are contaminated.

Processors: The Ohio Department of Agriculture will take samples of food, produce and final products for radioactive contamination analysis. After testing, they will determine if products are safe for processing and distribution. ***Do not process foods or release products until they are determined to be safe.***

Distributors: The Ohio Department of Agriculture will inspect shipments to check for radioactive contamination. After testing, they will determine if the shipment is safe for distribution. This testing may take several days. ***Do not release products until they are determined to be safe.***

If a decision is made to dispose of any products, state representatives will advise you on proper disposal.

Post-Emergency Actions

This section describes post-emergency actions that may occur following a serious radiological accident.

- **Reentry** - If you were evacuated from your area, temporary entry to your property may be permitted, under controlled conditions, so you can perform essential tasks such as securing property, milking dairy animals and watering/feeding animals. Instructions will be given through news bulletins and social media regarding route use and safety precautions.
- **Recovery** - Recovery involves reducing the amount of radiation exposure to acceptable levels for normal daily living. It also involves returning affected areas to pre-emergency conditions as quickly as possible, eventually leading to the safe return of the public, if possible.

The Ohio Department of Agriculture, Ohio Environmental Protection Agency, Ohio Department of Health, and other state agencies will give advisories on recovery efforts. Contaminated food will be restricted to prevent entry into the market. State and local officials will determine if disposal is necessary.

Price-Anderson Act / Nuclear Insurance

The Price-Anderson Act, enacted by Congress in 1957, requires that operators of nuclear power plants and certain other nuclear facilities purchase liability insurance policies for the protection of the public. Insurance pools are in place to pay claims, including those of farmers, food distributors and processors.

During recovery, locations of claim centers will be announced on local radio and television stations. Maintain a record of your expenses incurred as a result of the emergency. For additional information on nuclear insurance, contact:

U.S. Nuclear Regulatory Commission
Office of Public Affairs
Washington, D.C. 20555-0001
Phone: 1-800-368-5642
https://www.nrc.gov/

Additional Information / Resources

Additional copies of this brochure can be obtained by contacting your local OSU Extension Office, your county emergency management agency, the Ohio Department of Agriculture or Ohio EMA. You can also download a copy from the following websites:
Ohio Department of Agriculture
Ohio Emergency Management Agency

Additional information on radiological emergencies and agricultural protective actions are available from the following agencies:

Ohio Department of Agriculture
8995 East Main Street
Reynoldsburg, OH 43068
Phone: 614-728-6201
http://www.agri.ohio.gov/

Ohio Department of Health
246 North High Street
Columbus, OH 43215
Phone: 614-466-3543
https://www.odh.ohio.gov/

Ohio State University Extension
2120 Fyffe Road, Agriculture Admin Bldg.
Columbus, OH 43210
Phone: 614-292-4077
https://extension.osu.edu/

Ohio Environmental Protection Agency
50 West Town Street, Suite 700
Columbus, OH 43215
Phone: 614-728-3778
http://epa.ohio.gov/

Ohio Emergency Management Agency
2855 West Dublin-Granville Road
Columbus, OH 43235
Phone: 614-889-7150
http://ema.ohio.gov/

Ohio Department of Natural Resources
2045 Morse Road
Columbus, OH 43229
Phone: 614-265-6565
http://ohiodnr.gov/

USDA-Ohio Farm Service Agency
200 North High Street, Room 540
Columbus, OH 43215
Phone: 614-255-2441
https://www.fsa.usda.gov/state-offices/Ohio/index

Local Extension Agency:

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County EMA, Phone No:

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STATE OF OHIO
DEPARTMENT OF AGRICULTURE
8995 EAST MAIN STREET
REYNOLDSBURG, OHIO 43068